



## LIFE COURSE CENTRE WORKING PAPER SERIES

### Can Pre-Recorded Evidence Raise Conviction Rates in Cases of Domestic Violence?

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## NON-TECHNICAL SUMMARY

In Australia it is estimated that close to one in four women have experienced at least one instance of Domestic Violence (DV) since the age of 15 (ABS, 2017). In an effort to reduce the prevalence of DV, governments in Australia and elsewhere have passed laws and introduced policies designed to emphasise the criminal nature of DV. One such policy is the Domestic Violence Evidence-in-Chief (DVEC) reforms, which came into effect in New South Wales (NSW) on 1 June 2015. The DVEC reforms allow victims of DV to provide testimony through the use of a pre-recorded video statement with police.


A prior study conducted by the NSW Bureau of Crime Statistics and Research (see Yeong & Poynton, 2017), found limited evidence suggesting that the presence of a DVEC statement may raise the probability of a conviction. However, as we noted (2017, p. 13):

*“The impact of DVEC on court outcomes should continue to be monitored. NSW courts were the first in Australia to accept video statements as evidence-in-chief for DV matters. It may take time for complainants to begin to trust the new process, be willing to consent to video statements and pursue criminal charges. Police expertise in collecting evidence of sufficient quality will also continually improve. If further enhancements are made to procedural safeguards for victims in criminal proceedings, then over the longer term we may see the DVEC reforms achieve their ultimate aim; to enhance victim safety and reduce domestic and family violence in our community.”*

The objective of the present study is to follow up on the initial short-term evaluation and determine whether or not the presence of a DVEC statement raises the probability of a conviction in cases of DV assault.

The findings from the present study can be summarised in the following four points. First, the presence of a DVEC statement raises the overall probability of a conviction by six percentage points (an increase from about 76% to 82%). Second, when we restrict our analysis to the one in four DV cases that proceed to a defended hearing, we find that the presence of a DVEC statement raises the probability of a conviction by about 17 percentage points (an increase from about 70% to 87%). Third, we find no evidence to indicate that the presence of a DVEC statement has any impact on the probability of a guilty plea. And finally, in exploring the difference between the results from the present study and the previous evaluation, we find evidence consistent with the proposition that the NSW justice system required additional time to adopt and adjust to the DVEC reforms.

We believe that our paper makes two contributions to public policy and research. First, to the best of our knowledge, we provide the first empirical evidence that establishes a causal link between pre-recorded evidence and court outcomes. And second, the difference between the results presented in this paper and our prior work highlights the need for both researchers and policymakers to allow for sufficient implementation and follow-up time before deciding whether or not a policy was effective in achieving its objectives.



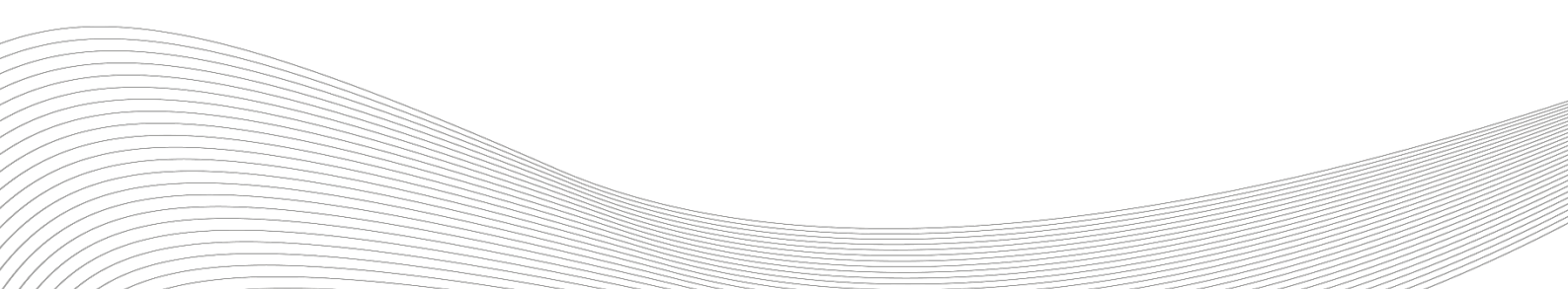
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## ABSTRACT

The objective of the present study is to determine whether or not pre-recorded evidence raises the probability of a conviction in cases of Domestic Violence (DV) assault. In order to answer this question, we use administrative police and court data from the Australian state of New South Wales (NSW). The data contains information for cases involving at least one DV assault charge that was finalised between 1 June 2015 and 31 August 2018. Using these data we exploit exogenous variation in the availability of pre-recorded evidence in an Instrumental Variables framework. We find that pre-recorded evidence increases the probability of a conviction by six percentage points. In relative terms, when compared to cases without pre-recorded evidence, this equates to an increase of 7.9 per cent. When we restrict our sample to the one in four cases that proceed to a defended hearing, we find that pre-recorded evidence raises the probability of a conviction by 17.1 percentage points (a relative increase of 24.5%).

**Keywords:** pre-recorded evidence; domestic violence; convictions; instrumental variables; Australia

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## 1. Introduction

Domestic Violence (DV) is a major public policy problem in both the developed and developing worlds.<sup>1</sup> In Australia it is estimated that close to one in four women have experienced at least one instance of DV since the age of 15 (ABS, 2017). The national cost of DV over the 2015-16 financial year was estimated at about 22 billion Australian dollars (KPMG, 2016). To put this figure in context, the size of the Australian government budget deficit over the same period was 39.6 billion Australian dollars (Commonwealth Treasury, 2016).

In an effort to reduce the prevalence of DV, governments in Australia and elsewhere have passed laws and introduced policies designed to emphasise the criminal nature of DV.<sup>2</sup> These approaches depend heavily on the successful prosecution of offenders. DV prosecutions, however, often fail because victims, after reporting DV to police, decline to give evidence. This is partly responsible for the relatively low conviction rate in cases of DV when compared to other types of violent crime.<sup>3</sup> In an attempt to address this issue, the NSW Parliament introduced the *Criminal Procedure Amendment (Domestic Violence Complainants) Act 2014 (NSW)*. This legislative change, which we refer to hereafter as the Domestic Violence Evidence-in-Chief (DVEC) reforms, allowed victims of DV to provide their evidence-in-chief via a pre-recorded video statement with police.<sup>4</sup>

The admission of pre-recorded evidence in place of live testimony for vulnerable victims is a relatively recent innovation to the criminal justice system. For this reason the empirical research examining the use of pre-recorded evidence in court proceedings is limited. What little research that does exist, focuses on the experiences of the relevant stakeholders in the criminal justice system.<sup>5</sup> While the general consensus from this literature is that victims,

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<sup>1</sup> In our setting, the Australian state of NSW, DV is defined as an offence committed by a person against another person with whom the person who commits the offence has (or has had) a domestic relationship. Interested readers are directed to the *Crimes (Domestic and Personal Violence) Act 2007 (NSW)* for more information.

<sup>2</sup> See for example, Angrist (2006); Berk et al. (1992); Berk et al. (1998) and Iyengar (2009).

<sup>3</sup> For example, between 2015 and 2018, the conviction rate for matters in which the most serious charge was a DV and non-DV offence, were 77.6 and 92.7 per cent, respectively.

<sup>4</sup> That is, evidence adduced by the prosecution from the victim in support of their case.

<sup>5</sup> Interested readers are directed to Burton et al. (2006) and Davies and Hanna (2013), who report the findings from interviews with victims, witnesses and legal practitioners, before and after the introduction of pre-recorded

police and legal practitioners view pre-recorded evidence favourably, it is not yet known whether its use in court proceedings has any impact on case outcomes.<sup>6</sup>

One exception is an earlier report on the DVEC reforms by the NSW Bureau of Crime Statistics and Research. In the previous study, Yeong and Poynton (2017) focused on the first 12 months of the policy's implementation, and did not find compelling evidence to indicate that the presence of a DVEC statement had any substantive impact on the probability of a conviction. However, as Yeong and Poynton (2017, p. 13) note:

*“The impact of DVEC on court outcomes should continue to be monitored. NSW courts were the first in Australia to accept video statements as evidence-in-chief for DV matters. It may take time for complainants to begin to trust the new process, be willing to consent to video statements and pursue criminal charges. Police expertise in collecting evidence of sufficient quality will also continually improve. If further enhancements are made to procedural safeguards for victims in criminal proceedings, then over the longer term we may see the DVEC reforms achieve their ultimate aim; to enhance victim safety and reduce domestic and family violence in our community.”*

The fact that the DVEC reforms were the first of their kind in Australia, in conjunction with the relatively short follow up period (i.e. 12 months of post-policy data), raises questions regarding whether the justice system required more time to implement, adopt and adjust to the reforms. The present study allows us to explore this possibility by leveraging 36 months of post-policy data. The data used in the present study also contains more detailed information relating to each assault, thus allowing us to employ a more sophisticated empirical approach.

The remainder of this paper is structured as follows. Section 2 provides an overview of the NSW Justice System and the DVEC reforms. Section 3 details the data used in this paper. Section 4 outlines our empirical approach. Section 5 tests the assumptions underlining our

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evidence in the United Kingdom and New Zealand, respectively. Readers are also directed to Westera et al. (2011) who investigate police perceptions of the effectiveness of pre-recorded evidence in New Zealand.

<sup>6</sup> There are a variety of qualitative studies that attempt to answer this question. Interested readers are directed to Davies and Hanna (2013); Henderson et al. (2012); Westera et al. (2011); and finally, Westera et al. (2015, 2016), who all report increases in the accuracy of victim testimony resulting from pre-recorded evidence.

approach, and then reports the main results. Section 6 concludes the paper with a discussion of the findings and implications for researchers and policymakers.

## ***2. Institutional setting***

### ***2.1 The NSW Justice System***

In NSW, criminal proceedings begin when the NSW Police or any other properly constituted authority (e.g. the Director of Public Prosecutions) charges a person with one or more offences.<sup>7</sup> Once this occurs, the charge must be finalised in court. There are three ways in which criminal proceedings can be finalised in a NSW Local Court.<sup>8</sup> First, the defendant can enter into a plea of guilty. In this case the offence is recorded as proven, and the defendant proceeds to sentencing. Second, the defendant can enter a plea of not guilty. This leads to a defended hearing. During the course of a defended hearing, the prosecution and defence present their respective arguments before the presiding magistrate. The magistrate is then tasked with deciding whether or not the defendant is guilty. It is worth noting that a defendant can change their plea during the course of criminal proceedings. For example, a defendant could enter into a plea of not guilty, and then change their plea to guilty half way through a defended hearing. Finally, the prosecution can withdraw the charges or the court can dismiss them. Throughout the remainder of this paper we refer to any finding of guilt, through either guilty plea or verdict, as a “conviction”.<sup>9</sup>

### ***2.2 The Domestic Violence Evidence-in-Chief reforms***

The Domestic Violence Evidence-in-Chief (DVEC) reforms came into effect for all DV charges commencing on or after 1 June 2015. The reforms changed the way in which complainants in DV cases are able to provide evidence. Prior to the reforms, conditional on consent, attending police took written statements from victims of DV. If the police then proceeded to charge the suspect and the matter went to a defended hearing, DV victims were required to provide their main evidence (i.e. direct examination) live in court. The DVEC

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<sup>7</sup> Multiple charges can and often are finalised at a single court appearance with potentially different outcomes.

<sup>8</sup> There are six criminal court jurisdictions in NSW. These courts include the Children’s Court, Coroner’s Court, Drug Court, Local Court, District Court, and finally, the Supreme Court. In our study we focus exclusively on matters finalised in the Local Court. We do not believe that this confounds the generalisability of our findings as 90 per cent of all DV related assaults cases are finalised at the Local Court level.

<sup>9</sup> In NSW a proven offence does not necessarily result in a criminal conviction because NSW sentencing legislation allows the Local Court to dismiss a proven offence without a conviction or penalty.

reforms changed this process in two ways. First, the reforms allowed attending police to conduct a video interview with victims instead of taking a written statement; and second, the reforms enabled the video recording to be used in place of direct examination for all legal proceedings relating to a DV offence.<sup>10</sup>

Although the option to provide a DVEC statement was legally available to all complainants in DV matters from 1 June 2015, the actual implementation of the reforms meant that this did not hold true in practice. Accompanying the reforms was a police directive stating that only officers with “DVEC training” were permitted to take DVEC statements.<sup>11</sup> The NSW Police Force’s Family and Domestic Violence Unit (FDVU) was responsible for implementing the DVEC training.<sup>12</sup> During the initial rollout of the training, the FDVU would select cohorts of about 100 officers at a time from different Police Area Commands (PACs) and draft them into training on a given day. There were only two considerations in this selection process. First, priority was given to patrol officers as these officers most often deal with cases of DV; and second, the corresponding PAC’s duty roster had to allow for them to attend the training.<sup>13</sup>

Once a DVEC trained officer arrives at the scene of a DV incident, the officer typically completes the following sequence of events. First, the officer asks the victim to provide a DVEC statement. If the victim refuses, the officer then attempts to take a written statement. If the victim refuses, the officer records the incident without a statement. Thus, in order for a

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<sup>10</sup> There are four additional points of note. First, defendants must be given the opportunity to view the recording at least once prior to any court appearance. Second, evidence of how an accused person behaves in front of police while viewing the recording is inadmissible. Third, the defendant is under no circumstances allowed to obtain a copy of the recording, although they are served with an audio extract. Finally, once the police have the recording they are able to use it in criminal proceedings against the wishes of the victim, although this is an extremely rare occurrence.

<sup>11</sup> DVEC training involves three components. First an online module introducing police to the basic concepts of the legislation and how to structure a DVEC interview must be completed. Second, police officers are required to attend a three-hour seminar that includes some practical exercises (e.g. role plays). And finally, police are required to pass a 20-question test to ensure they have understood the materials.

<sup>12</sup> Specifically, two high-ranking officers from the FDVU were responsible for delivering the training. The first was Chief Inspector Sean McDermott, Manager of the FDVU; and the second was Senior Sergeant Alissa Parker, Police Prosecutor. Extensive correspondence with these officers forms the basis for much of the information outlined in this section.

<sup>13</sup> Following the initial scale up, the FDVU then began training smaller groups of specialist DV prosecutors and DV liaison officers. The idea was to train these specialists such that they could then provide DVEC training to new recruits coming off their probationary year. Once again, these groups were selected on the basis of the corresponding PAC’s duty roster.



DVEC statement to occur, an officer with DVEC training must be matched to a consenting victim.

There are at least four mechanisms through which a DVEC statement may increase the probability of a conviction. First, DVEC statements may provide prosecutors with additional leverage during plea negotiations. Second, because DVEC statements more graphically reveal the demeanour and experience of the victim proximate to the time of the event, they may strengthen the magistrate's confidence in the prosecution's case. Third, the opportunity to view the statement immediately prior to cross-examination may improve the victim's capacity to accurately recall events, thus increasing their credibility as a witness. And finally, the existence of a DVEC statement may reduce the capacity for the defendant to intimidate the victim into changing or recanting their evidence, resulting in fewer victims withdrawing from court proceedings.

### **3. *Data***

Our analysis focuses on cases where the alleged DV assault was reported to police after the introduction of the reforms, on 1 June 2015. We utilise two datasets in our study. The first is an extract from the NSW Bureau of Crime Statistics and Research's Reoffending Database (ROD). The ROD extract contains information for all legal proceedings involving at least one DV assault charge finalised in a NSW Local Court between 1 June 2015 and 31 August 2018.<sup>14</sup> The second dataset is an extract from the NSW Police Force's Computerised Operational Policing System (COPS). The COPS extract contains information relating to all Common Assault and Assault occasioning Actual Bodily Harm (ABH) incidents recorded by police between 1 June 2015 and 30 June 2018.<sup>15</sup>

After merging these two datasets together, we are left with a rich suite of information for all finalised Local Court appearances involving at least one DV assault charge (which we generically refer to as a case). For each case, we are able to observe both the date upon which the matter was finalised, and the courthouse where the matter was finalised. We are also able to observe the defendant's bail status at finalisation, age, gender, Indigenous status, and socioeconomic status (as measured by their SEIFA percentile rank) at the time of

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<sup>14</sup> Note that in NSW, 90 per cent of DV charges are finalised at the Local Court level.

<sup>15</sup> Common Assault and ABH, respectively, constitute about 71 and 27 per cent of all DV Assault matters finalised at the NSW Local Court level.

finalisation.<sup>16</sup> For each charge within a given case, we are able to observe which Police Area Command (PAC) was responsible for charging the defendant, the date they charged the defendant, whether they initially granted bail to the defendant, an identifier for the victim involved in the DV assault, the defendant's plea and outcome for each charge, and finally, the Australian and New Zealand Offence Classification (ANZSOC) code associated with each charge.<sup>17</sup>

Table 1 presents descriptive statistics for variables used in our study. The first row from Table 1 reports information regarding our treatment indicator, which is a binary variable equal to one for cases with a DVEC statement, zero otherwise. From this row we can see almost half of the cases in our sample have a DVEC statement.

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<sup>16</sup> SEIFA scores are a measure of socioeconomic disadvantage based on the defendant's postcode of residence at the time of finalisation. Higher scores indicate lower levels of disadvantage. Defendants held on remand at the time that their matter was finalised have missing SEIFA scores in our data. In order to address this issue, as a robustness check reported in Table A3 of the Appendix, we create an indicator variable for these defendants to prevent them from dropping out of the regression. This results in no meaningful change to the main results. Interested readers are directed to ABS (2011b) for more information pertaining to SEIFA scores.

<sup>17</sup> ANZSOC codes are used to group offences by type across Australian and New Zealand jurisdictions. Interested readers are directed to ABS (2011a) for more information.

**Table 1: Descriptive statistics**

	Full sample			Without DVEC			With DVEC			Difference	
	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.	Estimate	Std Err.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<u>Treatment variable</u>											
DVEC	36,894	0.477	0.499	-	-	-	-	-	-	-	-
<u>Outcome variables</u>											
Conviction	36,894	0.786	0.410	19,312	0.763	0.425	17,582	0.811	0.391	0.048	(0.000)
Guilty Plea	36,894	0.604	0.489	19,312	0.585	0.493	17,582	0.624	0.484	0.039	(0.000)
Conviction at Defended Hearing	9,089	0.719	0.449	4,750	0.697	0.459	4,339	0.743	0.437	0.046	(0.000)
Guilty Plea at Defended Hearing	9,089	0.273	0.445	4,750	0.262	0.440	4,339	0.285	0.451	0.023	(0.015)
Withdrawn	36,894	0.145	0.352	19,312	0.163	0.369	17,582	0.125	0.331	-0.037	(0.000)
<u>Control variables</u>											
Actual Bodily Harm	36,894	0.273	0.446	19,312	0.251	0.434	17,582	0.297	0.457	0.046	(0.000)
SEIFA percentile	34,808	42.558	26.591	18,314	42.652	27.320	16,494	42.453	25.759	-0.199	(0.485)
Legal representation	36,882	0.794	0.405	19,307	0.779	0.415	17,575	0.810	0.392	0.031	(0.000)
Male	36,893	0.817	0.387	19,311	0.801	0.399	17,582	0.834	0.372	0.033	(0.000)
Indigenous	36,459	0.245	0.430	19,053	0.227	0.419	17,406	0.264	0.441	0.038	(0.000)
Age (in years)	36,892	35.637	11.374	19,311	35.573	11.412	17,581	35.708	11.331	0.135	(0.256)
On bail at finalisation	36,894	0.829	0.377	19,312	0.840	0.367	17,582	0.817	0.387	-0.023	(0.000)
Granted bail by police	36,894	0.735	0.441	19,312	0.748	0.434	17,582	0.721	0.448	-0.026	(0.000)
Number of prior convictions (last 5 years)	36,894	1.567	2.180	19,312	1.538	2.204	17,582	1.599	2.152	0.061	(0.007)

Table 1 reports descriptive statistics for variables used in our study. Columns 1-3, 4-6 and 7-9 report statistics for the entire sample, cases without DVEC statements, and cases with DVEC statements, respectively. Columns 1, 4 and 7 report the number of observations within each variable-subsample combination. Columns 2, 5 and 8 report the mean of each variable-subsample combination. Columns 3, 6 and 9 report the standard deviation of each variable-subsample combination. Column 10 reports the estimated difference between columns 8 and 5. Finally, column 11 reports the robust standard error associated with the estimate in column 10.

Rows 2-6 provide information for different outcome measures.<sup>18</sup> The first outcome measure, which we refer to as a *conviction*, is a binary variable equal to one if the defendant is found guilty of at least one charge at their court appearance, zero otherwise. We look at case level outcomes (instead of charge level outcomes) to prevent the practice of charge stacking from contaminating our estimates.<sup>19</sup> Table 1 indicates that the overall conviction rate for DV assault cases in our sample is 78.6 per cent. Also worth noting is that cases with DVEC statements are about five percentage points more likely to result in a conviction (81.1% vs. 76.3%).

The second outcome measure, which we refer to as a *guilty plea*, is a binary variable equal to one if the defendant enters into a guilty plea for at least one charge at their court appearance, zero otherwise. Overall, 60.4 per cent of cases result in a guilty plea. Cases with a DVEC statement are about four percentage points more likely to result in a guilty plea (62.4% vs. 58.5%).

The third outcome measure, which we refer to as a *conviction at defended hearing*, restricts the sample to cases that proceed to a defended hearing, and then takes value one if the defendant is found guilty of at least one charge, zero otherwise. Three points are of note with respect to this outcome. First, about one in four cases proceed to a defended hearing. Second, the overall probability of a conviction among these cases is 71.9 per cent. And finally, cases with a DVEC statement are about five percentage points more likely to result in a conviction at a defended hearing (74.3% vs. 69.7%).

The fourth outcome measure, which we refer to as a *guilty plea at defended hearing*, restricts the sample to cases that proceed to a defended hearing, and then takes value one if the defendant enters into a guilty plea, zero otherwise.<sup>20</sup> This occurs in about 27.3 per cent of cases overall, and is about two percentage points more likely to occur in cases with a DVEC statement (28.5% vs. 26.2%). This difference is not statistically significant.

Our final outcome measure, which we refer to as *withdrawn*, is a binary variable equal to one if the prosecution withdraws all charges, zero otherwise. This occurs 14.5 per cent of the time

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<sup>18</sup> Note that these outcomes are not mutually exclusive, thus prohibiting the use of a multinomial model.

<sup>19</sup> That is, the practice of police charging defendants with multiple offences in order to have them plead guilty to one in exchange for dropping the others.

<sup>20</sup> That is, cases where the defendant enters into a plea of not guilty at committal and then changes their plea to guilty during the course of a defended hearing.

overall, and is about three percentage points less likely to occur in cases with a DVEC statement (12.5% vs. 16.3%).

The remaining rows in Table 1 report summary statistics for the control variables in our study. Defendants in our sample are, on average, approximately 36 years old and have about 1.6 prior convictions (for any offence). The majority are accused of Common Assault rather than ABH (72.7% vs. 27.3%), have below average SEIFA scores, are non-Indigenous (75.5% of the time), male (81.7% of the time), legally represented (79.4% of the time), granted bail by police and on bail at finalisation (73.5% and 82.9% per cent of the time, respectively).

Table 1 suggests that cases with DVEC statements are more likely to result in a conviction. However, it is important to remember that DVEC statements are not randomly assigned to cases. For example, from Table 1 we can also see that defendants in cases with DVEC statements are more likely to be male, Indigenous, accused of a more serious DV offence, and refused bail by police. Hence, the key question to ask is whether or not the higher conviction rate among cases involving a DVEC statement is a result of the statement, or simply a reflection of the defendant's risk profile. The proceeding section describes how we plan to answer this question.

## 4. Empirical Approach

### 4.1 Selection bias

We begin by considering an Ordinary Least Squares (OLS) regression of Eq. (1).

$$Pr(y_{ijpdt} = 1) = \beta DVEC_{ijpdt} + \gamma \mathbf{X}'_i + ABH_i + day_d + \theta_p + \lambda_t + u_{ijpdt} \quad (1)$$

In Eq. (1),  $y_{ijpdt}$  is a binary variable equal to one if the defendant in case  $i$ , accused of assaulting victim  $j$ , who was charged by police from PAC  $p$ , on Day Of the Week (DOW)  $d$ , in month-year  $t$ , is convicted of at least one offence, zero otherwise.  $DVEC_{ijpdt}$  is a binary variable equal to one for cases involving a DVEC statement, zero otherwise.  $\mathbf{X}'_i$  represents the set of defendant-case level covariates described in Table 1. In addition to these covariates,  $\mathbf{X}'_i$  also includes a set of indicator variables each taking the value one for the ANZSOC code associated with the principal offence finalised at the court appearance. The purpose of these offence Fixed Effects (FEs) is to control for variation in the likelihood of a conviction

stemming from other (non-DV assault) charges finalised at the court appearance.<sup>21</sup>  $ABH_i$  is a binary variable taking value one for cases where the DV assault charge is Assault Occasioning Actual Bodily Harm (ABH), zero for cases where the DV assault charge is Common Assault. The purpose of this indicator variable is to control for the possibility that cases involving an ABH charge are both more likely to involve a DVEC statement and result in a conviction.  $\theta_p$  represents a set of PAC FEs, which control for time invariant systematic differences in the likelihood of a conviction between PACs. These differences could arise as a result of cultural attitudes toward DV on the part of police or communities living within the jurisdiction of each PAC (i.e. neighbourhood effects).  $\lambda_t$  represents a set of month-by-year FEs. These time FEs control for seasonal variation in conviction rates and the passage of time. Finally,  $u_{ijpdt}$  is the error term.

The coefficient of interest in Eq. (1) is  $\beta$ , which represents the expected percentage point difference in the probability of a conviction between cases with and without a DVEC statement. However, the fact that victim consent is required in order to obtain a DVEC statement means that we cannot interpret  $\beta$  as a causal effect. There are at least two competing forces at work here. The first, which we refer to as “cooperation bias”, is on the side of the victim. If more cooperative victims provide better evidence and are more likely to consent to DVEC, then an OLS regression of Eq. (1) would cause us to *overestimate*  $\beta$ . This is because we would misattribute cooperativeness to the presence of a DVEC statement.

The second, which we refer to as “marginality bias”, is on the side of the police. If attending officers perceive the evidence at hand to be weak, they may more strongly encourage victims to provide a DVEC statement. In this case, an OLS regression of Eq. (1) would cause us to *underestimate*  $\beta$ , as cases with DVEC would have systematically weaker evidence and thus a lower ex-ante probability of a conviction.

## 4.2 Identification strategy

In order to address these concerns, we exploit plausibly exogenous variation in the likelihood that the attending officer had DVEC training. Recall from Section 2.2 that the Family and Domestic Violence Unit (FDVU) had only two considerations in selecting individual officers

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<sup>21</sup> In the robustness checks, reported in Table A3 of the Appendix, we restrict the sample to (the two-thirds of) cases in which the DV assault charge is the principal offence. We find no meaningful change to the main results.

for training. First, the FDVU prioritised patrol officers; and second, the corresponding PAC's duty roster had to allow for the officers to undertake training on the day in question. The crux of our argument is that, because officers were assigned to training on the basis of their PAC's duty roster, which we assume to be conditionally independent of the probability of a conviction, whether or not the attending officer had been DVEC trained is a valid instrument for the probability of a DVEC statement.

Unfortunately, data constraints prevent us from identifying individual officers, let alone observing when individual officers received DVEC training. As a second best measure, we proxy whether or not the attending officer(s) had DVEC training with the corresponding PAC's proportion of DVEC eligible cases that had DVEC statements. The intuition is to use cases without DVEC statements (originating from PACs with a low uptake of the training), as a counterfactual for cases with DVEC statements (originating from PACs with a high uptake of the training). The idea being that the former cases would have involved a DVEC statement, had the attending officer been from a PAC with a high uptake of the training.

### 4.3 *Estimation and implementation*

Implementation of this Instrumental Variables (IV) strategy closely follows Dahl et al. (2014) and more recently, Dobbie et al. (2018). Like these authors, we implement this strategy in five steps. In the first step we begin by obtaining the residuals from an OLS regression of  $DVEC_{ijpdt}$  on the DOW, ABH, PAC and month-by-year FEs, denoted as  $DVEC_{ijpdt}^*$  in Eq. (2).

$$DVEC_{ijpdt}^* = DVEC_{ijpdt} - day_d - ABH_i - \theta_p - \lambda_t \quad (2)$$

There are four benefits to this residualisation procedure. First, conditioning out the DOW FEs allows us to account for the possibility of DVEC trained officers being assigned to particular shifts after they received training.<sup>22</sup> The second is that conditioning out  $ABH_i$  controls for the possibility that victims involved in more severe assaults are also more likely to provide DVEC statements. Third, the PAC FEs allow us to account for PAC specific factors such as (time invariant) budgeting allocations, cultural attitudes toward DV from police, and attitudes toward DV from the population of civilians living within the geographical boundaries of each

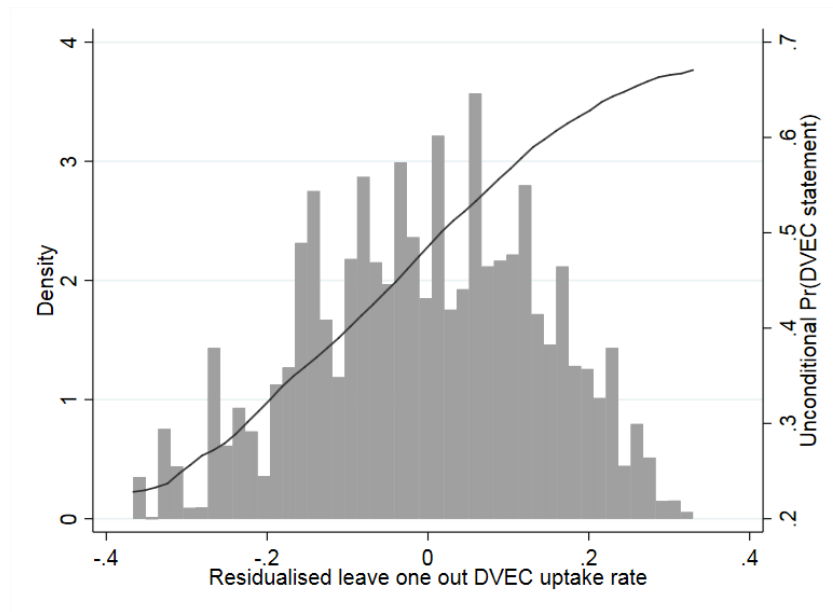
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<sup>22</sup> For example, it could be that DVEC trained officers are systematically more likely to work on a Friday or Saturday night.

PAC (i.e. neighbourhood effects). Finally, the month-by-year FEs limit our comparison to cases within the same month-year, which is important given the seasonality in DV offending and the increasing utilisation of DVEC over time.

The second step addresses the possibility that the same officer(s) may respond to reports from the same victim on multiple occasions. This could be problematic if, for example, the level of rapport developed over time between police and victims influences both the probability of a conviction and a DVEC statement. In order to address this concern, for each DV assault incident recorded in COPS, we re-construct our instrument as the corresponding PAC's number of DVEC statements, divided by the total number of incidents that could have potentially resulted a DVEC statement, after leaving out all incidents relating to the index victim within the last six months.<sup>23</sup> This “leave-one-out” instrument is summarised in Eq. (3), where  $\eta_{pt}$  is each PAC's number of unique incident-victim combinations over a six-month period and  $\eta_{jpt}$  is the number of incidents relating to victim  $j$  within the last six months.

$$Z_{ijpdt} = \left( \frac{1}{\eta_{pt} - \eta_{jpt}} \right) \left( \sum_{k=0}^{\eta_{pt}} DVEC_{ikpdt}^* - \sum_{j=0}^{\eta_{jpt}} DVEC_{ijpdt}^* \right) \quad (3)$$



**Fig. 1. The DVEC uptake rate**

<sup>23</sup> In the robustness checks, presented in Table A3 of the Appendix, we report estimates using several variations in how we construct the instrument. By-and-large, we find no meaningful change to the main results.



Fig. 1 plots the density function for our instrument, which we refer to as the “DVEC uptake rate”, on the left vertical axis. From Fig. 1 we can see that the DVEC uptake rate ranges from -0.37 to 0.33 with a mean of -0.00 and standard deviation of 0.14. The sample from which it is constructed includes 58 PACs and six complete half-years.<sup>24</sup> Fig. 1 implies that moving from the PAC-half-year combination with the lowest uptake to the highest raises the probability of a DVEC statement by 70 percentage points. Fig. 1 also provides a graphical representation of the first stage relationship using a local linear regression on the right vertical axis. One can clearly see an almost linear monotonically increasing relation between the instrument and the probability of a DVEC statement.<sup>25</sup>

The third step in our analysis is to estimate an OLS regression of the first stage relationship presented in Eq. (4); where  $v_{ijpdt}$  is the error term and all other variables have the same definition as in Eq. (1). The coefficient of interest in Eq. (4) is  $\alpha_1$ . For a given change in the instrument,  $\Delta Z_{ijpdt}$ , the product  $\alpha_1 \times \Delta Z_{ijpdt}$  provides us with the percentage point change in the probability of a DVEC statement occurring.

$$Pr(DVEC_{ijpdt} = 1) = \alpha_0 + \alpha_1 Z_{ijpdt} + \phi X'_i + ABH_i + day_d + \theta_p + \lambda_t + v_{ijpdt} \quad (4)$$

The fourth step in our analysis is to estimate an OLS regression of the Reduced Form (RF) relationship presented in Eq. (5); where the interpretation of  $\pi_1$  is analogous to the interpretation of  $\alpha_1$ ,  $\varepsilon_{ijpdt}$  is the error term, and all other variables have the same definition as in Eq. (1).

$$Pr(y_{ijpdt} = 1) = \pi_0 + \pi_1 Z_{ijpdt} + \xi X'_i + ABH_i + day_d + \theta_p + \lambda_t + \varepsilon_{ijpdt} \quad (5)$$

The final step in our analysis is to compute the ratio  $\pi_1/\alpha_1$ . The assumptions that underpin valid identification of this Two-Stage Least Squares (2SLS) estimate are described in Section 4.4, while interpretation of  $\pi_1/\alpha_1$  is covered in Section 4.5.

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<sup>24</sup> We designate the first and second half of a given year to occur between January - June, and July - December, respectively. Thus, we technically have seven half years as the earliest month in the data is June 2015.

<sup>25</sup> In Table A2 of the Appendix we report the results from several tests surrounding the monotonicity assumption. We find strong evidence in support this assumption holding.

#### **4.4 Identifying assumptions**

There are three identifying assumptions that underpin our approach.<sup>26</sup> First, the DVEC uptake rate must be sufficiently associated with the probability of a DVEC statement. This empirically testable assumption, often referred to as the “relevance assumption”, is covered in Section 5.1. Second, net of controls and FEs, the DVEC uptake rate must exert no influence over the probability of a conviction other than through its impact on the probability of a DVEC statement. This assumption, often referred to as the “exclusion restriction”, is not empirically testable. However, we do provide some evidence in favour of the exclusion restriction holding in Section 5.3. The final assumption requires the probability of a DVEC statement to be a monotonically increasing function of the DVEC uptake rate. This assumption, often referred to as the “monotonicity assumption”, is not empirically testable. However, in Table A2 of the Appendix we provide strong evidence in favour of it holding.

#### **4.5 Interpretation**

Assuming that these conditions are satisfied, then in the textbook case where both the instrument and treatment variables are binary, the ratio  $\pi_1/\alpha_1$  provides us with the average treatment effect of an intervention on an outcome, among the subpopulation of “compliers” whose treatment status is sensitive to the instrument (i.e. the Local Average Treatment Effect (LATE)).

However, our study deviates from the textbook case in two ways. First, our instrument is continuous; and second, there are no “always-takers” in our setting.<sup>27</sup> The fact that our instrument is continuous means that our estimates cannot be interpreted as a conventional LATE.<sup>28</sup> Instead, 2SLS IV estimates derived using a continuous instrument must be interpreted as a weighted average of LATEs along different margins of the instrument.<sup>29</sup> However, the fact that a victim cannot provide a DVEC statement to an officer without

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<sup>26</sup> Interested readers are directed to Imbens and Angrist (1994) for an introduction to the assumptions that underpin identification in an IV setup.

<sup>27</sup> That is, defendants who receive the treatment irrespective of the instrument. Interested readers are directed to Angrist et al. (1996) who provide an introduction to terminology used in IV studies.

<sup>28</sup> As a robustness check, reported in Table A3 of the Appendix, we follow Angrist et al. (2000) and recode our continuous instrument into a binary variable with no meaningful change to the main results.

<sup>29</sup> Interested readers are directed to Cornelissen et al. (2016) for an introduction to settings with a continuous instrument and heterogeneous treatment effects.

DVEC training means that there are no, or at most, an extremely small number of always-takers in our sample.<sup>30</sup> The fact that there are no always-takers in our sample has important implications for interpreting our estimates. As first noted by Bloom (1984), in circumstances with one-sided non-compliance, the LATE is approximately equal to the Average Treatment Effect on the Treated (ATT).<sup>31</sup> Thus, provided that the DVEC uptake rate is conditionally independent of the probability of a conviction, the ratio  $\pi_1/\alpha_1$  provides us with a causal estimate of the ATT. That is, the effect of a DVEC statement on the probability of a conviction among cases that would have resulted in a DVEC statement if the attending officer had training.

## 5. Results

### 5.1 First stage estimates and the relevance assumption

In order for the IV strategy outlined in the previous section to work, our instrument must be sufficiently associated with the probability of a DVEC statement occurring. Table 2 reports the results from an empirical test of this assumption.<sup>32</sup> Column 1 reports the results from an OLS regression of Eq. (4) without any controls or FEs. The first stage estimate indicates that a 10 percentage point increase in the DVEC uptake rate is associated with a 0.09 percentage point increase in the probability of a DVEC statement occurring.<sup>33</sup> In column 2 we include all of the FEs used in constructing the instrument (i.e. those presented in Eq. (2)). From this column we can see that a 10 percentage point increase in the DVEC uptake rate is associated with a 0.07 percentage point increase in the probability of a DVEC statement occurring. In column 3 we include the full set of controls and FEs from Eq. (1). The first stage remains largely unchanged. Table 2 also reports the Sanderson-Windmeijer (SW) Chi-Squared and F-Statistics which test for under and weak identification, respectively. These statistics indicate that our instrument easily meets the relevance assumption.

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<sup>30</sup> In Table A1 of the Appendix we estimate the proportion of compliers, always-takers and never-takers in our sample using the same approach as Abedie (2003), Dahl et al. (2014) and Dobbie et al. (2018). We find strong evidence in support of the proposition that there are no always-takers in our sample.

<sup>31</sup> Interested readers are directed to Angrist (2006) for an empirical application of this logic to the Minneapolis Domestic Violence Experiment.

<sup>32</sup> All standard errors reported in Table 2 (and throughout the remainder of the paper) are clustered at both the court and PAC level. There are 137 courts and 58 PACs in our sample.

<sup>33</sup> That is, the expected change in the probability of a DVEC statement from a 10 percentage point increase in the DVEC uptake rate is given by  $0.10 \times 0.914 = 0.091$  rounded to three decimal places.

**Table 2: First stage relationship**

	(1)	(2)	(3)
First stage estimate	0.914*** (0.054)	0.720*** (0.032)	0.723*** (0.034)
Constant	0.480*** (0.003)	0.255*** (0.016)	0.237*** (0.043)
SW Chi-Squared	296.48	519.78	454.04
SW F-Statistic	291.36	509.42	442.16
Observations	36,894	36,894	34,374
Controls	N	N	Y
PAC FE	N	Y	Y
Time FE	N	Y	Y
Court FE	N	N	Y

*Two way cluster robust standard errors in parentheses,  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\**

## 5.2 Randomisation test

In Section 4 we argued that our instrument is related only to the probability of a conviction through its influence over whether or not a DVEC statement is taken. While it is impossible to formally test this assumption, if the exclusion restriction does hold, then there should be no relationship between our instrument and any observable defendant-case characteristics. In Table 3 we report the results from an empirical test of this proposition.

**Table 3: Randomisation test**

	(1)	(2)
Defendant characteristics	DVEC	Instrument
Age	0.000 (0.000)	0.000 (0.000)
Indigenous	-0.002 (0.009)	0.002 (0.002)
Male	0.063*** (0.010)	0.001 (0.001)
Legally represented	-0.003 (0.008)	0.002 (0.002)

On bail at finalisation	-0.003 (0.011)	-0.001 (0.002)
Granted bail by police	-0.014* (0.008)	0.001 (0.002)
Number of prior convictions	-0.003 (0.002)	-0.001* (0.000)
SEIFA score	-0.000 (0.000)	-0.000 (0.000)
Partial F-Statistic	6.97***	1.24
Observations	34,374	34,374
Controls	Y	Y
PAC FE	Y	Y
Time FE	Y	Y
Court FE	Y	Y

*Two way cluster robust standard errors in parentheses,  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\**

Table 3 reports estimates from two OLS regressions. In column 1 we regress the DVEC indicator on the full set of controls and FEs from Eq. (1). We then report the coefficients for the defendant-case level covariates (described in Table 1) and the partial F-Statistic after excluding these covariates. The partial F-Statistic is statistically significant, which is unsurprising given the balance test from Table 1. In column 2 we repeat this process but instead regress the DVEC uptake rate on these same controls and FEs. By-and-large, the coefficients are now statistically insignificant, and crucially, the partial F-Statistic is not significant at any conventional level. Although this doesn't completely validate the exclusion restriction, it does indicate that there is no relationship between any observable defendant-case characteristics and our instrument.

### **5.3 The effect of DVEC on convictions**

Now that we have provided evidence in support of the identifying assumptions described in Section 4.4, we turn to our main results. These results are presented in Table 4. The first row from Table 4 presents the estimates from an OLS regression of Eq (1). Rows 2 and 3 report the Reduced Form (RF) and Two-Stage Least Squares (2SLS) estimates, respectively. Columns 1, 2, 3, 4, and 5 refer to the probability of a conviction, guilty plea, conviction among cases that proceed to a defended hearing, guilty plea among cases that proceed to a defended hearing, and withdrawal, respectively.

**Table 4: Estimates for the effect of DVEC on case level outcomes**

	(1)	(2)	(3)	(4)	(5)
	Conviction	Guilty plea	Conviction at Defended Hearing	Guilty Plea at Defended Hearing	Withdrawn
OLS Estimates	0.035*** (0.006)	0.023*** (0.007)	0.045*** (0.013)	0.009 (0.012)	-0.025*** (0.005)
RF Estimates	0.044* (0.026)	0.007 (0.038)	0.123*** (0.053)	0.046 (0.043)	-0.021 (0.024)
2SLS Estimates	0.060* (0.036)	-0.009 (0.052)	0.171** (0.071)	0.064 (0.057)	-0.029 (0.033)
Observations	34,374	34,374	8,388	8,388	34,374
Controls	Y	Y	Y	Y	Y
PAC FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Court FE	Y	Y	Y	Y	Y

*Two way cluster robust standard errors in parentheses,  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\**

The key findings from Table 4 can be summarised into the following six points. First, a simple OLS regression indicates that presence of a DVEC statement is associated with small, but statistically significant increases across all of the outcomes, with the exception of guilty plea at defended hearing. Second, the RF estimates indicate that there is only a significant relationship between the DVEC uptake rate and two of our five outcomes. These outcomes include the probability of a conviction and the probability of a conviction at defended hearing. Third, the 2SLS estimates suggest that the presence of a DVEC statement raises the probability of a conviction by six percentage points. In relative terms, when compared to cases without a DVEC statement, this equates to an increase of 7.9 per cent. Fourth, the 2SLS estimate in column 3 suggests that the bulk of this impact is driven by a 17.1 percentage point increase in the probability of a conviction among (the one in four) cases that proceed to a defended hearing. In relative terms, this equates an increase of 24.5 per cent. Fifth, the fact that DVEC appears to be most effective in cases that proceed to a defended hearing provides support for the marginality bias argument put forward in Section 4.1. And finally, the fact the OLS and 2SLS estimates in column 5 are so similar suggests that the loss of significance

might be due to the larger standard errors induced by the 2SLS procedure, rather than the absence of an effect.<sup>34</sup>

## **6. Discussion**

Domestic Violence (DV) is a major public policy problem across the developed and developing worlds. Given the prevalence, economic and social costs of DV, a better understanding of policies aimed at reducing rates of DV is crucial for policymakers. The admission of pre-recorded evidence in cases of DV is one such policy. In this study we set out to determine whether or not the presence of pre-recorded evidence (i.e. DVEC statements in our context) increases the probability of a conviction in cases of DV assault.

Our findings suggest that the answer to this question is “yes”. Our estimates indicate that the presence of a DVEC statement raises the probability of a conviction by six percentage points (7.9% in relative terms). We also found that among the one in four cases that proceed to a defended hearing, the presence of a DVEC statement raises the probability of a conviction by 17.1 percentage points (a relative increase of 24.5%).

The fact that the bulk of the impact appears to occur among cases that proceed to a defended hearing suggests that pre-recorded statements have a substantive impact on the presiding magistrate’s assessment of the case. There are at least two mechanisms through which pre-recorded statements may generate this impact. First, because pre-recorded statements are taken as soon as practical to the time of the offence, they serve to illustrate the demeanour and emotional experience of the victim proximate to the event. This may serve to strengthen the magistrate’s assessment of the prosecution’s case. Second, because victims have the opportunity to view the pre-recorded statement prior to cross-examination, these statements may reduce any inconsistencies in testimony that inevitably arise with the passage of time. We believe that unpacking these, and other potential mechanisms in further detail to be a promising direction for future research.

One remaining question is why the results from the present study differ from Yeong and Poynton (2017). There are three possibilities. First, the empirical approach used in the previous study may have been unable to adequately address the concerns raised in Section 4.

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<sup>34</sup> While considered reporting the results from a modified Hausman test, in which one trade-offs the potential bias under OLS against the inefficiency of 2SLS, we elected not to as there is to date no compelling literature surrounding the power requirements of this test.

Second, the criminal justice system may have required more time to adjust to the new practice. And finally, it could be some combination of these two possibilities. In Table A4 of the Appendix we work toward answering this question by using the empirical approach from the present study on the previous study's sample. The results from this test strongly support the proposition that the justice system simply required more time to adjust to the reforms.

To conclude, we believe that our paper makes two contributions to public policy and research. First, to the best of our knowledge, we provide the first empirical evidence that establishes a causal link between pre-recorded evidence and court outcomes. And second, the difference between the results presented in this paper and prior work highlights the need for both researchers and policymakers to allow for sufficient implementation and follow-up time before deciding whether or not a policy was effective in achieving its objectives.



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## Appendix

Following Dahl et al. (2014) and Dobbie et al. (2018), we define compliers as cases involving victims that would have provided a DVEC statement had the attending officer come from the PAC with the highest uptake rate, but not if the attending officer came from the PAC with the lowest. This is summarised in Eq. (A1), where  $\bar{z}$  and  $\underline{z}$  denote the PAC with the highest and lowest DVEC uptake rate, respectively.

$$P_c \equiv \Pr(DVEC_{ijpdt} | Z_{ijpdt} = \bar{z}) - \Pr(DVEC_{ijpdt} | Z_{ijpdt} = \underline{z}) \quad (A1)$$

Further, by monotonicity and independence, the proportion of always-takers is given by the probability of providing a DVEC statement to officers from the PAC with the lowest uptake rate, as in Eq. (A2).

$$P_a \equiv \Pr(DVEC_{ijpdt} = 1 | Z_{ijpdt} = \underline{z}) \quad (A2)$$

And finally, the fraction of never-takers is given by the probability of not providing a DVEC statement to officers from the PAC with the highest uptake rate, as in Eq. (A3).

$$P_n \equiv \Pr(DVEC_{ijpdt} = 0 | Z_{ijpdt} = \bar{z}) \quad (A3)$$

Hence, after obtaining the first stage estimates (reported in Table 2), we can calculate  $P_c$ ,  $P_a$  and  $P_n$  as  $\alpha_1(\bar{z} - \underline{z})$ ,  $\alpha_0 + \alpha_1\underline{z}$  and  $1 - \alpha_0 - \alpha_1\bar{z}$ , respectively. Table A1 presents these calculations using three designations for  $\bar{z}$  and  $\underline{z}$ . Columns 1, 2 and 3, respectively, designate the PAC-half-year combination with the top/bottom 1.0, 1.5 and 2.0 per cent of values for their DVEC uptake rates as  $\bar{z}$  and  $\underline{z}$ .

**Table A1: Fractions of compliers, always-takers and never-takers**

	1%	1.50%	2%
	(1)	(2)	(3)
Compliers	0.455	0.443	0.429
Never takers	0.548	0.553	0.558
Always takers	-0.003	0.004	0.014

Three observations are of note with respect to Table A1. First, about 45 per cent of victims in DV Assault cases are sensitive to our instrument. Second, about 55 per cent of victims in DV assault cases would be unwilling to provide a DVEC statement, irrespective of our instrument. And finally, there are clearly no, or at most, an extremely small number of always-takers in our sample.

Table A2 checks the monotonicity assumption by reporting the first stage estimate among various subgroups of our sample. Columns 1 and 2 restrict the sample to cases without and with legal representation, respectively. Columns 3 and 4 restrict the sample to cases in which the police did not and did grant bail, respectively. Columns 5 and 6 restrict the sample to cases in which the defendant was not and was on bail at the time that the matter was finalised, respectively. Columns 7 and 8 restrict the sample to cases involving female and male defendants, respectively. Columns 9 and 10 restrict the sample to cases involving non-Indigenous and Indigenous defendants, respectively. Columns 11 and 12 restrict the sample to cases involving defendants with above and below average SEIFA scores, respectively. Columns 13 and 14 restrict the sample to cases involving defendants with zero and greater than zero prior convictions, respectively. And finally, Columns 15 and 16 restrict the sample to cases where the DV charge is Common Assault and ABH, respectively. The consistency in the sign and size of the estimates is strongly supportive of the monotonicity assumption.

**Table A2: Monotonicity checks**

	Legal representation		Granted bail by police		On bail at finalisation		Gender		Indigenous		SEIFA		Prior convictions		DV Assault	
	No	Yes	No	Yes	No	Yes	Female	Male	No	Yes	Above average	Below average	No	Yes	Common	ABH
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
First stage	0.696*** (0.000)	0.730*** (0.000)	0.764*** (0.000)	0.705*** (0.000)	0.794*** (0.000)	0.712*** (0.000)	0.714*** (0.000)	0.720*** (0.000)	0.716*** (0.000)	0.726*** (0.000)	0.635*** (0.000)	0.772*** (0.000)	0.702*** (0.000)	0.750*** (0.000)	0.762*** (0.000)	0.606*** (0.000)
Observations	7,314	27,060	8,441	25,933	4,881	29,493	6,420	27,954	26,354	8,020	13,242	21,132	16,148	18,226	25,105	9,269
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PAC FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Court FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

*Two way cluster robust standard errors in parentheses,  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\**

Table A3 reports the estimates from our robustness checks. Columns 1 and 2 restrict the sample to court appearances where the principal offence is a DV assault and report OLS and 2SLS estimates, respectively. This sample restriction results in a loss of about one-third of the total sample. By-and-large, all of the estimates in columns 1 and 2 are consistent in size, sign and significance with their counterparts in Table 4. Columns 3 and 4 report estimates where we convert our (continuous) SEIFA percentile control variable into a set of five binary variables. The first four take value one for a quartile of the SEIFA distribution. The fifth binary variable takes value one for defendants with a missing SEIFA score, zero otherwise. Estimates from columns 3 and 4 are largely consistent with their Table 4 counterparts. Column 5 reports estimates where we convert our (continuous) instrument into binary variable equal to one if the attending PAC's uptake rate is above the NSW average, zero otherwise. Column 6 reports estimates where we instrument DVEC using a set of four binary variables. Each of these variables takes value one for a quartile of the DVEC uptake rate's distribution. 2SLS estimates using these instruments are largely consistent with the main results. Columns 7 - 9 report estimates where we re-construct the instrument using different periods of time. Column 7 reports 2SLS estimates using an unresidualised version of our bi-annual DVEC uptake rate. These estimates are qualitatively similar to their Table 4 counterparts. Columns 8 and 9 report unresidualised and residualised versions of our instrument constructed over a year, respectively. Once again, these estimates, although less precisely measured, are broadly consistent in size and sign with their Table 4 counterparts.

**Table A3: Robustness checks**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Conviction	0.040*** (0.009)	0.054 (0.050)	0.034*** (0.006)	0.074** (0.032)	0.026 (0.046)	0.042 (0.045)	0.062* (0.036)	0.080 (0.051)	0.076 (0.051)
Guilty Plea	0.028*** (0.009)	-0.005 (0.060)	0.023*** (0.007)	0.004 (0.052)	-0.034 (0.063)	-0.032 (0.067)	-0.007 (0.051)	0.019 (0.059)	0.015 (0.059)
Conviction at Defended Hearing	0.049*** (0.017)	0.238*** (0.088)	0.044*** (0.012)	0.179*** (0.062)	0.138 (0.108)	0.124* (0.069)	0.168** (0.070)	0.202** (0.087)	0.206** (0.088)

Guilty Plea at Defended Hearing	0.021 (0.016)	0.066 (0.052)	0.012 (0.012)	0.054 (0.058)	0.036 (0.074)	0.065 (0.068)	0.057 (0.057)	0.045 (0.076)	0.050 (0.076)
Withdrawn	-0.030*** (0.007)	-0.011 (0.048)	-0.024*** (0.005)	-0.043 (0.031)	-0.019 (0.040)	-0.035 (0.040)	-0.031 (0.033)	-0.040 (0.047)	-0.036 (0.046)
Estimation method	OLS	2SLS	OLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Controls and fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Instrument type	-	Continuous	-	Continuous	Binary	Quartile	Continuous	Continuous	Continuous
Time period for instrument	-	Bi-annual	-	Bi-annual	Bi-annual	Bi-annual	Bi-annual	Annual	Annual
Residualised	-	Y	-	Y	Y	Y	N	N	Y

*Two way cluster robust standard errors in parentheses,  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\**

Table A4 compares estimates from the previous study (replicated in the first row for convenience), against estimates using the empirical approach from the present study, on the previous study's sample. Although the coefficients differ slightly in size, one can clearly see that the qualitative conclusion is the same.

**Table A4: Comparison of estimates between current and previous work**

	Conviction		Guilty plea	
	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)
Previous estimates	0.020*** (0.007)	-0.027 (0.039)	0.000 (0.007)	-0.046 (0.044)
Restricted sample	0.030*** (0.008)	-0.014 (0.081)	0.012 (0.011)	-0.133 (0.118)
Controls	Y	Y	Y	Y
PAC FE	Y	Y	Y	Y
Time FE	Y	Y	Y	Y
Court FE	Y	Y	Y	Y

*Two way cluster robust standard errors in parentheses,  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\**